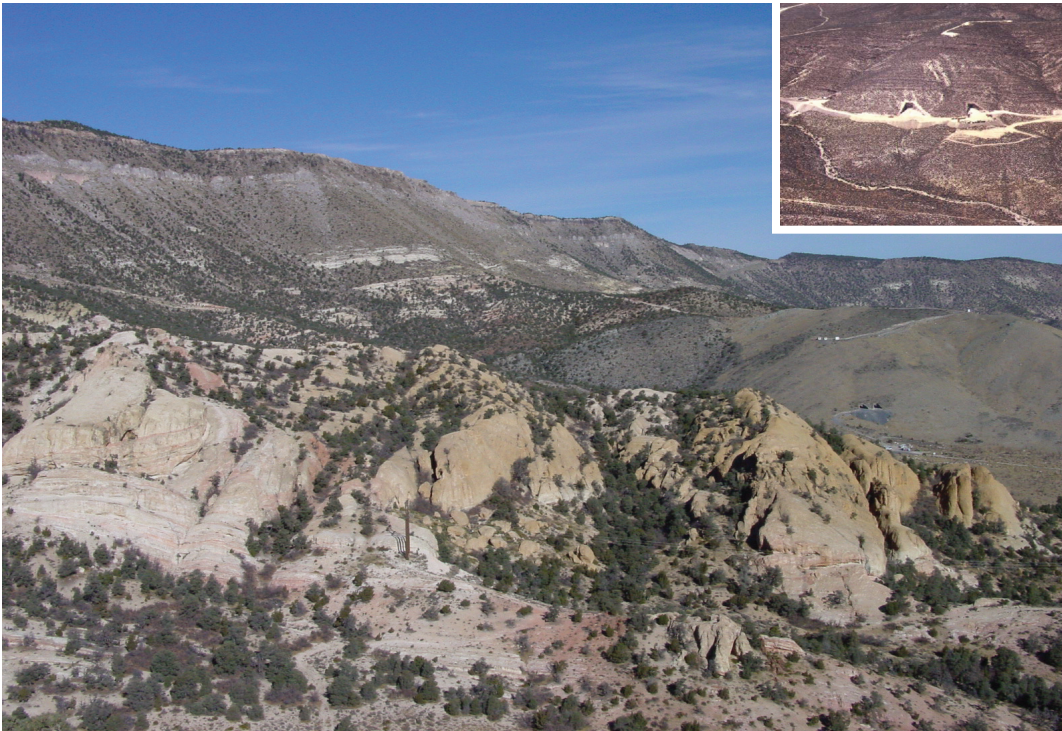


TTD: Tunnel Target Defeat

Advanced Concept Technology
Demonstration (ACTD)



Throughout the years, over 20 members across several Los Alamos divisions have collaborated in this multidisciplinary program to create sophisticated computer models that address geologic uncertainties, penetration mechanics, and ground shock propagation.

Left: Rainier Mesa as seen from the south, Nevada Test Site. Los Alamos geologists have studied these rocks extensively.

Inset: Tunnels at the Nevada Test Site

Background

LANL provided support for the defeat of Hard and Deeply Buried Targets (HDBTs) through the development and use of sophisticated computational capabilities to address issues in geologic uncertainties, penetration mechanics, and ground shock propagation. The TTD ACTD was set to conclude this past FY with a high explosive underground experiment DIVINE STRAKE at the Nevada Test Site. However it was cancelled due to litigation issues. DoD management re-directed the program to include a calculation on a past nuclear event, DIABLO HAWK, in the N-tunnel complex. EES-11 will conclude its DIABLO HAWK calculation this calendar year.

Capabilities

LANL's involvement has been threefold: 1) develop realistic geologic/geomechanical earth models for targets of interest (i.e. DIVINE STRAKE and HDBT's at denied and in-accessible sites); 2) perform high-fidelity modeling of the effects of shock on geologic materials on these geophysical models; and 3) supply diagnostic capability (CORRTEX) to measure directly explosively generated shock at DIVINE STRAKE.

Future Applications

The Geologic Assessment Targets (GAMUT) was an important success of DoD's TTD ACTD, bringing the importance of 3-D geologic characterization to the forefront of high fidelity calculations. Future applications include the development of geologic framework models for remote and denied access sites, and a regional-scale hydrostratigraphic model of the Española Basin to aid in hydrologic modeling.

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Right: Cut-away view of the Rainier Mesa Geologic Framework Model showing the geologic stratigraphy and N-tunnel complex.

